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茶学研究专题

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► 学术文献

1 . **Bacteria-Premised Nanobiopesticides for the Management of Phytopathogens and Pests** (基于细菌的纳米生物农药用于植物病原体和害虫的管理)

简介: Rising awareness of the risks regarding chemical formulations and the surging need for eco-friendly inputs in sustainable agriculture have driven the use of bacterial biocontrol agents to the frontline of plant protection. Bacterial biocontrol agents (BBCAs) have been preferred as feasible alternatives to synthetic formulations due to their increased specificity and safety. Nanotechnology has facilitated the better addressing of product development and performance concerns related to BBCAs. Leveraging nanotechnology in the synthesis of novel nanomaterials with amended properties at the nanoscale has offered efficient and ecologically sound nanoformulations such as nanobiopesticides. The nanobiopesticides of bacterial origin, known as bacteria premised nanobiopesticides (B-NBPs), are efficient alternatives to agrochemicals. The B-NBPs include living or nonliving bacterial nanoformulations or nanoparticles synthesized using bacteria (BNPs) as the nanofactories. The B-NBPs were synthesized using high-pressure homogenization (HPH), jet milling, and hammer milling, giving rise to competent bacterial nanoformulations of size ranging from 250 to 500 nm. Following an overview of bacteria-based nanobiopesticides (B-NBPs) employed to prevent/treat plant diseases, the article highlights the role of BBCA's role in plant protection as well as its antagonistic mechanisms. Further, the concept of B-NBPs, concentrating on *Bacillus thuringiensis*-driven forms, is reviewed. The review then briefly explains the significance of BNPs in plant infection management. Finally, the concerns related to the efficacy of B-NBPs along with the prospects are also described.

来源: ACS Agricultural Science & Technology 期刊

发布日期:2023-04-23

全文链接:<http://agri.nais.net.cn/file1/M00/03/62/Csgk0UEYKl2ATzzXAJ0hC42y7-k154.pdf>

2 . **Nanopesticides in agricultural pest management and their environmental risks: a review** (纳米农药在农业害虫管理中的应用及其环境风险)

简介: Increasing global population demands modernization in agricultural production to achieve sustainable food security. The frequent pest infestation causes a significant economic loss and deleterious impact on agriculture production. While, the traditional application of conventional pesticides leads to loss of soil biodiversity, decline in pollinator population, and negative impacts on non-target organisms. In recent years, nanotechnology has gained much interest in agricultural application. Various studies have demonstrated the beneficial effect of engineered nanomaterials as an active ingredients or the nanoformulations in insect pest control and plant protection. Nanopesticides have shown more advantages over conventional pesticides in terms of high adsorption, reduced volatilization, improved tissue permeation, controlled release, etc. However, studies are also highlighting the potential toxicity of nanopesticides in non-target organism and their environmental risk. The goal of this review is to provide a comprehensive information on

recent developments in nanopesticides and its consequences in the environment. This review highlights various aspects of nanopesticides including, preparation methods, types, characterization techniques, importance in pest control, toxicity in plant and animal models, environmental risk, and current approaches in risk assessment and regulatory strategies.

来源: International Journal of Environmental Science and Technology 期刊

发布日期:2023-02-07

全文链接:<http://agri.nais.net.cn/file1/M00/10/34/Csgk0EEYKeWACoYDACJfKd52uFc420.pdf>

3. The scale insects: Its status, biology, ecology and management in tea plantations (茶园蚧虫的现状、生物学、生态学及管理)

简介: The scale insects reduce plant photosynthetic ability by sucking sap from leaves and causing significant damage to the tea crop in most tea-producing countries. They suck the sap from stems and tea leaves, which not only prevents further growth but also reduces the nutritional quality of the leaves by promoting the growth of sooty molds. However, due to the widespread use of organosynthetic pesticides in recent decades, most insect pests have developed high levels of pesticide resistance, reducing the effectiveness of insecticide application. Bio-control agents are environmentally safe and produce long-term results while reducing the use of chemicals and other pesticides without disrupting the natural equilibrium. The review includes a list of coccidicides discovered on tea in major tea-growing countries as potential tea pests. The scope of future studies and the plans for better management of this serious sucking pest of the tea plant are also discussed in this review.

来源: Frontiers in Insect Science 期刊

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全文链接:<http://agri.nais.net.cn/file1/M00/03/62/Csgk0UEYIBiAUED2AB5NeO7wa6E223.pdf>

4. Nanopesticides: A Systematic Review of Their Prospects With Special Reference to Tea Pest Management (纳米农药在茶园虫害管理的应用前景)

简介: **Aim:** Integrated pest management (IPM) in tea invites an multidisciplinary approach owing to the high pest diversity in the perennial tea plantation system. In this review, we have highlighted current developments of nanotechnology for crop protection and the prospects of nanoparticles (NPs) in plant protection, emphasizing the control of different major pests of tea plantations.

Methods: A literature search was performed using the ScienceDirect, Web of Science, Pubmed, and Google Scholar search engines with the following terms: nanotechnology, nanopesticides, tea, and insect pest. An article search concentrated on developments after 1988.

Results: We have described the impact of various pests in tea production and innovative approaches on the use of various biosynthesized and synthetic nanopesticides against specific insect pest targets. Simultaneously, we have provided support for NP-based technology and their different categories that are currently employed for the management of pests in different agro-ecosystems. Besides the broad categories of active ingredients (AI) of synthetic insecticides, pheromones and natural resource-based molecules have pesticidal activity and can also be used

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with NPs as a carriers as alternatives to traditional pest control agents. Finally, the merits and demerits of incorporating NP-based nanopesticides are also illustrated.

Conclusions: Nanopesticides for plant protection is an emerging research field, and it offers new methods to design active ingredients amid nanoscale dimensions. Nanopesticide-based formulations have a potential and bright future for the development of more effective and safer pesticide/biopesticides.

来源: Frontiers in Nutrition 期刊

发布日期:2021-08-10

全文链接:<http://agri.nais.net.cn/file1/M00/10/34/Csgk0EEYIAmAAbG8AB3EFOX5FoU234.pdf>

➤ 相关专利

1 . METHODS OF DELIVERING PLANT VIRUS-BASED NANOPESTICIDES (基于植物病毒的纳米农药的递送方法)

简介: A method of delivering an agricultural composition to a plant including determining a dose of the agricultural composition required to deliver a treatment effective amount of the at least one agrochemical agent to a target soil depth using a computational model, the agricultural composition including a plurality of plant viral nanoparticles (VNPs) and/or virus-like particles (VLPs) and at least one agrochemical agent, and applying the determined dose of the agricultural composition to the plant.

来源: 美国专利

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全文链接:<http://agri.nais.net.cn/file1/M00/03/62/Csgk0UEYN2KAP29LADBh7HBGZAs262.pdf>

➤ 科技图书

1. Inorganic Nanopesticides and Nanofertilizers (无机纳米农药和纳米肥料)

简介: 本书讨论了无机/金属纳米农药和肥料, 它没有对这一主题进行一般性回顾, 而是对所取得的成就进行了批判性评估, 并强调了未来允许农业从无机纳米颗粒的特性中获利的措施。它涵盖了各种主题, 包括制备具有成本效益的纳米颗粒的策略、它们在植物内外的化学性质、纳米颗粒在田间的影响以及当前的策略是否成功地提高了作物产量。本书将吸引学术界和工业界的读者, 以及任何对无机纳米农药和纳米肥料在农业中潜在用途感兴趣的人。

来源: SpringerLink 网站

发布日期:2022-05-26

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